Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

# General

## Title

Adult trauma care: percentage of patients age 18 years and older diagnosed with major anatomic injuries and admitted to a hospital within the trauma system that is not a Level 1 or Level 2 trauma center.

## Source(s)

Guide to quality indicators in adult trauma care. Version 3. Calgary (AB): Quality of Trauma in Adult Care, University of Calgary; 2013 Jan 29. 129 p. [111 references]

# Measure Domain

## Primary Measure Domain

Clinical Quality Measures: Process

## Secondary Measure Domain

Does not apply to this measure

# Brief Abstract

## Description

This measure is used to assess the percentage of patients age 18 years and older diagnosed with major anatomic injuries and admitted to a hospital within the trauma system that is not a Level 1 or Level 2 trauma center.

## Rationale

Each year, injuries affect 700 million people worldwide and result in more than five million deaths. In many countries, injuries are the leading cause of death among those under the age of 45 years. The human and societal burden is even greater with many survivors never returning to school, work or their "regular" lives.

Health care services provide patients with treatment for what is a major cause of morbidity and death. Yet medical errors and substandard care threaten trauma care. Half of all patients with major traumatic injuries do not receive recommended care, medical errors are common in critically ill trauma patients and

preventable trauma deaths in hospital are widely reported. The World Health Organization (WHO), professional trauma organizations (e.g., American College of Surgeons [ACS], Trauma Association of Canada and Royal Australasian College of Surgeons) and accreditation bodies have promoted efforts to improve the quality of care delivered to injured patients. However, before the quality of injury care can be improved, it needs to be measured using reliable and valid measures of health care quality.

These indicators can be used to assess patient safety, and to evaluate and improve quality of care by incorporating these measures into local, regional or national quality improvement efforts. Implementing a consistent approach to measurement (same indicators, same definitions, same data elements, same reporting format) would provide institutions with reliable performance data that is necessary for surveillance (e.g., tertiary survey completion), to track local problems (e.g., adverse events – specifically missed injuries), evaluate the effects of interventions or program changes (e.g., tertiary survey protocol) and provide comparisons across centers (e.g., benchmarking adverse events using programs such as the ACS's Trauma Quality Improvement Program). Well-designed, carefully evaluated and appropriately implemented quality indicators (QIs) may be essential tools for guiding efforts to improve health and healthcare.

Treatment of injured patients in the pre-hospital setting should include rapid transport to the closest appropriate facility. Under triage is defined as a triage decision that classifies patients as not needing trauma center care when in fact they are likely to benefit from this level of care (false negative triage) (ACS Committee on Trauma, 2006). Over triage is the decision that incorrectly classifies a patient as needing trauma center care when in fact they are unlikely to benefit from this level of care (false positive triage) (ACS Committee on Trauma, 2006).

The indicator has been constructed to complement QI *Protocol of Field Triage* and QI *Time to Definitive Trauma Center* (refer to the Quality of Trauma in Adult Care [QTAC] Prehospital Indicators set). It is intended to monitor rates of patients with major anatomic injuries admitted to hospitals without the resources to manage the patients' injuries and not to evaluate the initial destination hospital of emergency medical services (EMS) transports.

## Evidence for Rationale

American College of Surgeons (ACS) Committee on Trauma. Resources for optimal care of the injured patient 2006. Chicago (IL): American College of Surgeons (ACS); 2006.

Guide to quality indicators in adult trauma care. Version 3. Calgary (AB): Quality of Trauma in Adult Care, University of Calgary; 2013 Jan 29. 129 p. [111 references]

## Primary Health Components

Trauma care; major anatomic injury; field triage; under triage

## Denominator Description

All patients age 18 years and older diagnosed with major anatomic injuries AND admitted to a hospital within the trauma system (see the related "Denominator Inclusions/Exclusions" field)

## Numerator Description

All patients age 18 years and older diagnosed with major anatomic injuries AND admitted to a hospital within the trauma system that is not a Level 1 OR Level 2 trauma center

# Evidence Supporting the Measure

## Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

## Additional Information Supporting Need for the Measure

In a study conducted by Rosengart et al. (2007), 95% of Delphi panel participants ranked monitoring under triage and identifying causes as very important. Eight variables for risk adjustment have been used in the literature to examine this indicator: gender, race, age, Glasgow Coma Scale (GCS) at scene, Injury Severity Score (ISS), mechanism of injury, type of injuries and provider level (type) (Caterino, Valasek, & Werman, 2010; Chang et al., 2008; Haas et al., 2010; Lane, Sorondo, & Kelly, 2003; Meldon et al., 2002); however, it is unclear that risk adjustment should be used when measuring processes of care.

## Evidence for Additional Information Supporting Need for the Measure


Caterino JM, Valasek T, Werman HA. Identification of an age cutoff for increased mortality in patients with elderly trauma. Am J Emerg Med. 2010 Feb;28(2):151-8. PubMed

Chang DC, Bass RR, Cornwell EE, Mackenzie EJ. Undertriage of elderly trauma patients to state-designated trauma centers. Arch Surg. 2008 Aug;143(8):776-81; discussion 782. PubMed

Haas B, Gomez D, Zagorski B, Stukel TA, Rubenfeld GD, Nathens AB. Survival of the fittest: the hidden cost of undertriage of major trauma. J Am Coll Surg. 2010 Dec;211(6):804-11. PubMed

Lane P, Sorondo B, Kelly JJ. Geriatric trauma patients-are they receiving trauma center care?. Acad Emerg Med. 2003 Mar;10(3):244-50. PubMed

Meldon SW, Reilly M, Drew BL, Mancuso C, Fallon W. Trauma in the very elderly: a community-based study of outcomes at trauma and nontrauma centers. J Trauma. 2002 Jan;52(1):79-84. PubMed

Rosengart MR, Nathens AB, Schiff MA. The identification of criteria to evaluate prehospital trauma care using the Delphi technique. J Trauma. 2007 Mar;62(3):708-13. PubMed


## Extent of Measure Testing

Using a modification of the RAND/University of California, Los Angeles (UCLA) Appropriateness Methodology, a panel of 19 injury and quality of care experts serially rated and revised quality indicators identified from a systematic review of the literature and international audit of trauma center quality improvement practices. The quality indicators developed by the panel were sent to 133 verified trauma centers in the United States, Canada, Australia, and New Zealand for evaluation.

A total of 84 quality indicators were rated and revised by the expert panel over 4 rounds of review producing 31 quality indicators of structure (n=5), process (n=21), and outcome (n=5), designed to

assess the safety (n=8), effectiveness (n=17), efficiency (n=6), timeliness (n=16), equity (n=2), and patient-centeredness (n=1) of injury care spanning prehospital (n=8), hospital (n=19), and posthospital (n=2) care and secondary injury prevention (n=1). A total of 101 trauma centers (76% response rate) rated the indicators (1=strong disagreement, 9=strong agreement) as targeting important health improvements (median score 9, interquartile range [IQR] 8 to 9), easy to interpret (median score 8, IQR 8 to 9), easy to implement (median score 8, IQR 7 to 8), and globally good indicators (median score 8, IQR 8 to 9).

Thirty-one evidence-informed quality indicators of adult injury care were developed, shown to have content validity, and can be used as performance measures to guide injury care quality improvement practices.

Trauma centers rated the indicator "percentage of patients age 18 years and older diagnosed with major anatomic injuries and admitted to a hospital within the trauma system that is not a Level 1 or Level 2 trauma center" as targeting important health improvements (median score 9, IQR 8 to 9), easy to interpret (median score 8, IQR 7 to 9), easy to implement (median score 7, IQR 5 to 8), and globally a good indicator (median score 8, IQR 7 to 9).

### Evidence for Extent of Measure Testing

Santana MJ, Stelfox HT, Trauma Quality Indicator Consensus Panel. Development and evaluation of evidence-informed quality indicators for adult injury care. Ann Surg. 2014 Jan;259(1):186-92. [35 references] PubMed

## State of Use of the Measure

### State of Use

Current routine use

### Current Use

not defined yet

## Application of the Measure in its Current Use

### Measurement Setting

Emergency Department

Emergency Medical Services

Hospital Inpatient

### Professionals Involved in Delivery of Health Services

not defined yet

### Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

### Statement of Acceptable Minimum Sample Size

Unspecified

### Target Population Age

Age greater than or equal to 18 years

### Target Population Gender

Either male or female

## National Strategy for Quality Improvement in Health Care

### National Quality Strategy Aim

Better Care

### National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

## Institute of Medicine (IOM) National Health Care Quality Report Categories

### IOM Care Need

Getting Better

### IOM Domain

Effectiveness

## Data Collection for the Measure

### Case Finding Period

Unspecified

### Denominator Sampling Frame

Patients associated with provider

## Denominator (Index) Event or Characteristic

Clinical Condition

Institutionalization

Patient/Individual (Consumer) Characteristic

## Denominator Time Window

not defined yet

## Denominator Inclusions/Exclusions

Inclusions
All patients age 18 years and older diagnosed with major anatomic injuries AND admitted to a hospital within the trauma system

Note:

*Major anatomic injury* refers to specific anatomical injuries that can be diagnosed through inspection of the patient in the field and which may benefit from management at a Level 1 or Level 2 trauma center.
Inclusion criteria for patients with major anatomic injuries likely to benefit from admission to a Level 1 OR Level 2 trauma center are (satisfying any criterion is sufficient):

- Penetrating injury to head, neck, torso extremities (proximal to elbow or knee)
- Flail chest
- Greater than 2 proximal long-bone fractures
- Crush, degloved or mangled extremity
- Amputation proximal to wrist and ankle
- Pelvic fracture
- Open or depressed skull fracture
- Paralysis

The trauma system includes all acute care hospitals within the geographical area and/or operational boundaries of an inclusive trauma system.

Exclusions
Unspecified

## Exclusions/Exceptions

not defined yet

## Numerator Inclusions/Exclusions

Inclusions
All patients age 18 years and older diagnosed with major anatomic injuries AND admitted to a hospital within the trauma system that is not a Level 1 OR Level 2 trauma center

Note: The American College of Surgeons categorizes trauma centers into four levels based on human and physical resources; Level 1 (regional resource), Level 2 (comprehensive care), Level 3 (initial management) and Level 4 (initial evaluation).

Exclusions
Unspecified

## Numerator Search Strategy

Institutionalization

## Data Source

Administrative clinical data

Registry data

## Type of Health State

Does not apply to this measure

## Instruments Used and/or Associated with the Measure

Unspecified

# Computation of the Measure

## Measure Specifies Disaggregation

Does not apply to this measure

## Scoring

Rate/Proportion

## Interpretation of Score

Desired value is a lower score

## Allowance for Patient or Population Factors

not defined yet

## Standard of Comparison

not defined yet

## Prescriptive Standard

Under triage rate less than or equal to 5%

Note: The American College of Surgeons' Committee on Trauma (2006) has proposed that under triage rates can be as high as 5% and over triage rates range between 25% and 50%. These benchmarks were proposed using different methods of calculation. The Quality of Trauma in Adult Care (QATC) proposes using the American College of Surgeons' Committee on Trauma benchmark of less than or equal to 5% for under triage in order to make the measure sensitive for identifying patients with major anatomic injuries that may benefit from admission to a Level 1 or Level 2 trauma center.

## Evidence for Prescriptive Standard

American College of Surgeons (ACS) Committee on Trauma. Resources for optimal care of the injured patient 2006. Chicago (IL): American College of Surgeons (ACS); 2006.

Guide to quality indicators in adult trauma care. Version 3. Calgary (AB): Quality of Trauma in Adult Care, University of Calgary; 2013 Jan 29. 129 p. [111 references]

# Identifying Information

## Original Title

Field triage rate.

## Measure Collection Name

Quality Indicators in Adult Trauma Care

## Measure Set Name

Prehospital Indicators

## Submitter

Quality of Trauma in Adult Care (QTAC) Team, University of Calgary - Academic Institution

## Developer

Quality of Trauma in Adult Care (QTAC) Team, University of Calgary - Academic Institution

## Funding Source(s)

The project was supported by a Partnerships in Health System Improvement Grant (PHE-91429) from the Canadian Institutes of Health Research and Alberta Innovates Health Solutions. Funding sources had no role in the design, conduct, or reporting of this study.

## Composition of the Group that Developed the Measure

- Dr. H. Thomas Stelfox, Principal Investigator, University of Calgary
- Dr. Maria-Jose Santana, Co-investigator, University of Calgary
- Diane Lorenzetti, Library Science, University of Calgary
- Jamie Boyd, Research Coordinator, University of Calgary
- Nancy Clayden, Research Assistant, University of Calgary
- Colleen M. Sharp, Research Assistant, University of Calgary

Expert Panel

- Dr. Mark Asbridge, Faculty Member, Dalhousie University
- Dr. Chad G. Ball, Fellowship in Trauma, Critical Care and Hepatobiliary Surgery, Calgary
- Dr. Peter Cameron, Professor and Head of Critical Care Division, Head of Victorian State Trauma Registry, Associate Director of National Trauma Research Institute, Melbourne, Australia

- Diane Dyer, Consultant, Alberta Health Services
- Dr. Louis Hugo Francescutti, Past President of Royal College of Physicians and Surgeons of Canada, Professor, University of Alberta
- Marie Claire Fortin, Clinical Registries Manager, CIHI and Faculty Member, University of Toronto
- Dr. Ken Jaffe, Professor of Rehabilitation Medicine and Adjunct Professor of Pediatrics and Neurological Surgery, University of Washington School of Medicine
- Dr. Andrew W. Kirkpatrick, Past President Trauma Association of Canada, Professor of Critical Care Medicine and Surgery, University of Calgary
- Dr. John Kortbeek, Professor and Head of Department of Surgery, University of Calgary
- Dr. Karen Kmetik, Vice President of Performance Improvement American Medical Association
- Dr. Lynne Moore, Assistant Professor of Epidemiology/Biostatistics, Laval University
- Dr. Avery Nathens, Canada Research Chair in Trauma Systems Development, Professor of Surgery, University of Toronto
- Dr. Nick Phan, Division of Neurosurgery, University of Toronto
- Dr. Fred Rivara, Seattle Childrens Guild Endowed Chair in Pediatrics, Professor in Pediatrics, University of Washington
- Bryan Singleton, Senior Manager for Emergency Health Services, Paramedic, Alberta Ministry of Health and Wellness
- Dr. Marc Swiontkowski, CEO of TRIA Orthopedic Center, University of Minnesota
- Dr. John Tallon, Past President Trauma Association of Canada, Associate Professor of Emergency Medicine and Surgery, Dalhousie University
- Dr. Andrew Travers, Medical Director of Nova Scotia Emergency Medical Systems, Assistant Professor, Dalhousie Emergency Department of Medicine
- Dr. Dave Zygun, Associate Professor of Critical Care Medicine, University of Calgary
- Dr. Tom Noseworthy, Professor of Health Policy and Management, University of Calgary
- Dr. Sharon Straus, Canada Research Chair in Knowledge Translation, University of Toronto

## Financial Disclosures/Other Potential Conflicts of Interest

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## Adaptation

This measure was not adapted from another source.

## Date of Most Current Version in NQMC

2013 Jan

## Measure Maintenance

Unspecified

## Date of Next Anticipated Revision

Unspecified

## Measure Status

This is the current release of the measure.

## Measure Availability

Source available from the Quality of Trauma in Adult Care (QTAC) Web site .

This work is also available from the Annals of Surgery Web site : Santana MJ, Stelfox HT, Trauma Quality Indicator Consensus Panel. Development and evaluation of evidence-informed quality indicators for adult injury care. Ann Surg. 2014 Jan;259(1):186-92.

For more information, contact QTAC at the University of Calgary, Teaching Research & Wellness (TRW) Building, 3rd Floor, 3280 Hospital Drive NW, Calgary, AB, Canada, T2N 4Z6; Phone: 403-944-2334; Fax: 403-283-9994; E-mail: qtac@qualitytraumacare.com; Web site: www.qualitytraumacare.com .

## NQMC Status

This NQMC summary was completed by ECRI Institute on May 6, 2015. The information was verified by the measure developer on July 13, 2015.

## Copyright Statement



For more information, contact Tom Stelfox, MD, PhD, at the University of Calgary, Teaching Research & Wellness (TRW) Building, 3rd Floor, 3280 Hospital Drive NW, Calgary, AB, Canada, T2N 4Z6; Phone: 403-944-2334; Fax: 403-283-9994; E-mail: tstelfox@ucalgary.ca.

# Production

## Source(s)

Guide to quality indicators in adult trauma care. Version 3. Calgary (AB): Quality of Trauma in Adult Care, University of Calgary; 2013 Jan 29. 129 p. [111 references]

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